

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant :	Ramarge et al.	Art Unit :	3729
Serial No. :	10/762,290	Examiner :	Thiem D. Phan
Filed :	January 23, 2004	Conf. No. :	4684
Title :	MANUFACTURING PROCESS FOR SURGE ARRESTER MODULE USING PRE-IMPREGNATED COMPOSITE		

Mail Stop Amendment  
Commissioner for Patents  
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REPLY TO ACTION OF OCTOBER 16, 2006

In reply to the office action of October 16, 2006, applicant submits the following remarks.

Claims 8-22 and 33-39 are pending, with claim 8 being independent.

Independent claim 8 recites a method for manufacturing an electrical module assembly. The method includes providing an electrical module assembly including at least one MOV disk to which a reinforcing structure has been applied, and wrapping the electrical module assembly with shrink film. The method also includes compacting the wrapped electrical module assembly by heating the shrink film such that the shrink film shrinks and applies a compressive force to the electrical module assembly, and curing the reinforcing structure of the wrapped electrical module assembly at a temperature at which the shrink film no longer applies a compressive force.

Claims 8, 9, 12, 14-17, 33, 36, and 37 have been rejected as being unpatentable over U.S. Patent No. 5,218,508 (Doone). Applicant requests withdrawal of this rejection because Doone fails to describe or suggest heating a shrink film such that the shrink film shrinks and applies a compressive force to an electrical module assembly and curing the reinforcing structure of the electrical module assembly at a temperature at which the shrink film no longer applies a compressive force, as recited in claim 8.

Doone relates to a surge arrester 1 including metal oxide varistor blocks 2, a glass reinforced plastic shell bonded to outer surfaces of the blocks 2, and a sleeve 6 that is shrunk around the shell 5 and the blocks 2. See Doone at col. 5, lines 33-64 and Fig. 1. Doone explains that the blocks 2 are first wrapped in a pre-preg material that is cured. See Doone at col. 6, lines

34-44. The pre-preg material can be cured by "the equivalent technique of helically wrapping the arrester core with its pre-preg wrapping in a heat-shrink tape (e.g., a Mylar tape), then heat-curing the resin and finally removing the tape." See Doone at col. 6, lines 44-52. However, while Doone mentions the use of heat-shrink tape, Doone never describes that the heat-shrink tape is heated such that it shrinks and applies a compressive force to the arrester core and Doone never describes that the pre-preg material is cured (in addition to heating) at a temperature at which the heat-shrink tape no longer applies a compressive force. Rather, Doone merely explains that the resin (which is the pre-preg material) is cured and the tape is removed. See Doone at col. 6, lines 50-52. Moreover, while the passage mentions that the tape is removed at col. 6, line 52 (the passage cited in the office action), the mere removal of the tape does constitute the step of curing of the pre-preg material at a temperature at which the heat-shrink tape no longer applies a compressive force.

The office action has failed to make a prima facie case of obviousness, which requires that the reference teach each element of the claim. In this case, the office action has ignored the above recited elements of claim 8 and has failed to show where these elements are found in Doone. Moreover, the office action has further failed to provide any motivation as to why one of ordinary skill in the art would have modified Doone to provide for the additional above steps. Accordingly, claim 8 is allowable over Doone.

Claims 9, 12, 14-17, 33, 36, and 37 depend from claim 8 and are allowable for at least the reason that claim 8 is allowable, and for containing allowable subject matter in their own right. For example, claim 9 recites that the shrink film is a "bi-axially oriented polypropylene film." The office action points to the use of Mylar<sup>TM</sup> as a possible material for the heat-shrink tape in Doone. However, Mylar<sup>TM</sup> is not a bi-axially oriented polypropylene film; rather, it is a polyester film.

As another example, claim 12 recites that the temperature at which the wrapped electrical module assembly is compacted is of a different magnitude than the temperature at which the wrapped electrical module assembly is cured. However, Doone never describes that the array is cured at a temperature that is different from the temperature at which the pre-preg material is

heated to compact the array. Rather, Doone describes only that the resin is cured with heat and then the heat-shrink tape is removed. See Doone at col. 6, lines 48-52. The office action seems to suggest that the mere removal of the heat-shrink tape is somehow equivalent to curing of a reinforcing structure at a temperature at which a shrink film no longer applies a compressive force. While the removal of the heat-shrink tape would prohibit the heat-shrink tape from applying further compressive force to the array, there is nothing in this passage that would suggest that the lack of compressive force was due to curing of the pre-preg material at a temperature at which the heat-shrink tape no longer applies such a compressive force.

As a further example, claim 17 recites that the wrapped electrical module assembly is cured by cooling the electrical module assembly, removing the shrink film from the electrical module assembly, and curing the electrical module assembly without the shrink film after the heat shrink film is heated. Nothing in Doone suggests that the array would be cured without the heat-shrink tape after the heat-shrink tape is removed. The office action apparently realizes this deficiency in Doone and states that it is a "mere matter of design choice to remove the shrinking tape and cure the electrical module without the shrink tape since it is known in the art that the shrink tape stops shrinking further at certain temperatures and it appears that the invention would perform equally well with the shrink tape and sealant resin being cured simultaneously" rather than "having the shrink tape removed without further heating." First, applicant notes that claim 17 does not require that shrink tape and sealant resin be cured independently nor does claim 17 require that the shrink tape is removed without further heating. Second, the mere fact that shrink tape could stop shrinking further at certain temperatures does not alone provide motivation for curing of an electrical module assembly without a shrink film after the heat shrink film is heated. Third, the test to determine whether it would be proper to modify Doone is not whether the invention would or would not perform equally well in particular (and apparently irrelevant) conditions; rather, the test is whether one of ordinary skill in the art would have been motivated to modify Doone, in this case, to cool the array and also to cure the array without the heat-shrink tape around the array. The office action has failed to identify such motivation, and accordingly

has failed to establish a prima facie case of obviousness. For at least these reasons, claim 17 is allowable over Doone.

As another example, claim 36 recites that wrapping the electrical module assembly with shrink film includes securing the wrapped shrink film to the electrical module assembly. Doone never describes or suggests that the array is wrapped with the heat-shrink tape by securing the wrapped heat-shrink tape to the array. The office action points to col. 6, line 50 of Doone to somehow show such securing. However, this passage merely describes that the arrester core is wrapped with pre-preg wrapping in a heat-shrink tape and then the resin is heat-cured. Doone is silent on whether the wrapping includes securing and there is also nothing to suggest that the heat curing secures the pre-preg wrapping to the arrester core.

Claims 10 and 11 have been rejected as being unpatentable over Doone in view of U.S. Patent No. 5,842,096 (Mabbott). Applicant requests withdrawal of this rejection because Mabbott does not remedy the failures of Doone to describe or suggest the features of claim 8, from which claims 10 and 11 depend.

Mabbott relates to an image printing system for printing images onto a surface. See Mabbott at col. 1, lines 6-13. Mabbott does not relate to electrical module assemblies and therefore does not describe or suggest heating a shrink film such that the shrink film shrinks and applies a compressive force to an electrical module assembly and curing reinforcing structure of the electrical module assembly at a temperature at which the shrink film no longer applies a compressive force, as recited in claim 8. Accordingly, claim 8 is allowable over any proper combination of Doone and Mabbott, as are claims 10 and 11.

The office action points to col. 7, lines 27 and 28 of Mabbott to suggest that the heating of a shrink film at a particular temperature for a particular time is allegedly described in Mabbott and that such an alleged description would have motivated one of ordinary skill in the art to modify Doone "in order to facilitate manufacturing process due to its preferred quality." While Mabbott explains the benefits of using "Kaladex 2000" in the image formation process, there is nothing that would suggest the benefits of using Kaladex 2000 in making an electrical module assembly. Moreover, there is nothing in this passage that suggests that a shrink film is heated to

a temperature for a particular time. Rather, this passage merely explains that an image can be formed on a film form polyethylen naphthalate material that has a thermal stability that is designated in terms of film shrinkage values. See Mabbott at col. 7, lines 22-31.

Claims 13, 18-22, 34, 35, and 39 have been rejected as being unpatentable over Doone in view of U.S. Patent No. 6,008,975 (Kester). Applicant requests withdrawal of this rejection because Kester does not remedy the failures of Doone to describe or suggest the features of claim 8, from which claims 13, 18-22, 34, 35, and 39 depend.

Kester relates to a modular subassembly 10 of an electrical component that includes an array 20 of stacked electrical components retained within an insulative coating 16. See Kester at col. 4, lines 10-34 and Fig. 1. The insulative coating 16 includes a matrix 21 of resinous layers and a spiral wrapped fibrous tape segment 28 that is embedded within the matrix 21. See Kester at col. 5, lines 38-48 and Fig. 4. However, Kester's tape segment 28 is not a shrink film. Accordingly, Kester does not remedy the failure of Doone to describe or suggest heating a shrink film such that the shrink film shrinks and applies a compressive force to an electrical module assembly and curing reinforcing structure of the electrical module assembly at a temperature at which the shrink film no longer applies a compressive force, as recited in claim 8. Thus, any proper combination of Kester and Doone would still fail to describe or suggest the features of claim 8.

The office action suggests that it would have been obvious to combine Doone and Kester "by applying the wrapping tape" (which is presumably Kester's tape segment 28) to Doone's process "in order to cover completely the sealant resin." It is unclear how Doone's process could be modified to include Kester's tape segment 28 and how such a modification could cover completely a "sealant resin" of Doone. Any such modification of Doone would, at most, provide a pre-preg material that includes an embedded spiral tape segment but would not provide the requisite spiral winding of a shrink film around the array.

Claim 38 has been rejected as being unpatentable over Doone in view of U.S. Patent No. 4,298,900 (Avdeenko). Applicant requests withdrawal of this rejection because Avdeenko does

not remedy the failure of Doone to describe or suggest the features of claim 8, from which claim 38 depends.

Avdeenko relates to an overvoltage protection device that includes an insulating housing 48 around a column of resistors 43. See Avdeenko at abstract; col. 6, lines 51-62; and Fig. 3. Avdeenko never describes or suggests that a reinforcing structure is applied to the column of resistors or that the column is compacted by heating the insulating housing 48 and that a reinforcing structure is cured. Thus, any proper combination of Doone and Avdeenko would still fail to describe or suggest the features of claim 8. For these reasons, claims 8 and 38 are allowable over Doone and Avdeenko.

In conclusion, applicant submits that all claims are in condition for allowance. Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

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